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ABSTRACT

Compared are the application of direct (criterion referenced) and inferential (norm referenced) measurement to the educational diagnosis and remediation of children with learning disabilities. The task analysis approach is seen to require direct measurements for which standard reliability, validity, and item analysis evaluation procedures are inappropriate. The trend towards increasing use of task analysis is thought to require a more behavioral definition of learning disabilities. (DB)

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THE ROLE OF INFERENTIAL AND DIRECT MEASUREMENTS IN IDENTIFICATION AND EDUCATIONAL PLANNING FOR CHILDREN WITH LEARNING DISABILITIES

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During the past few years the field of Special Education has changed very rapidly. Each year new ideas and innovations become trends. Ideas and innovations thought by many to be the most appropriate approaches to education for exceptional children a few years ago, are now considered out of step with today's emphasis. This is the case in the area of screening and diagnosing of children with learning disabilities.

In an article by Barbara Bateman (1967), she identifies three approaches to screening and diagnosis of children with learning disabilities for educational planning. These are Etiological, Diagnostic Remedial and Task Analysis. Currently, the Diagnostic Remedial approach in various forms is in operation in many school districts throughout the states, while the Task Analysis approach is receiving increased emphasis in many school districts. The Etiological approach has declined in popularity and has been replaced by the Diagnostic Remedial or Task Analysis approach and sometimes a combination. This writer feels that the decline of the Etiological model has occurred because it does not yield the types of information needed by teachers to develop short (day-to-day) and long (unit) educational planning relevant to the child's needs. Bateman further points out that the Etiological approach emphasizes the identification of a number of behavioral characteristics that may be analyzed and identified as a syndrome or "condition". The information is then reported to the teacher. The report to the teacher also emphasizes where the child is performing relative to the total peer population and what level of performance might be expected from the child. Vague suggestions for educational planning are included.

The Diagnostic Remedial approach goes a step further. While identifying a set of behavioral characteristics, problem areas and specific types of remediation strategies are reported to teachers, the emphasis is on the way

the child receives and processes information. Educational tasks receive considerable attention but are not the primary concern.

The Task Analysis approach described by Bateman focuses on specific educational tasks that have been selected for a child to learn. De-emphasized are measurements that yield information about syndromes or "conditions" and more emphasis is placed on measuring more directly from the child's curriculum program. The desire is to identify a list of specific educational tasks the child knows or doesn't know, and to locate his level of skill development. (Ysseldyke and Salvia, 1974). This type of information is most helpful to the teacher for developing relevant remediation programs.

Thus, those who utilize the Task Analysis approach as the main component of their screening and identification program will discover that the very nature of inferential measurement prevents obtaining the information a teacher really needs to plan for children having special educational needs. An examination of the characteristics of inferential and direct measurements may bring clarity to this statement. By definition, the term inferential refers to measurement instruments or devices that derive their meanings from the application of inferential and descriptive statistics. Downie and Health (1965, p. 215) indicate that inferential measurements utilize reliability and validity correlation coefficients.

Reliability coefficients are statistical measurements that indicate the degree of consistency a test instrument will yield approximately the same results each time it is administered to a subject or group of subjects. Factors that affect test-retest reliability are the duration of time between test administrations, the actual length of the test and the homogenuity of the population being evaluated by the test.

Validity coefficients are statistical measurements that yield a measure of the degree to which a set of test scores correlate with an external measurement instrument. For example, compare the I.Q. score of a subject to the score the subject received on an achievement test. A prediction can be made from a subject's score on one test (I.Q.) about the probable score he will receive on another test (Academic Achievement).

Downie and Health indicate that another important statistical technique utilized by inferential tests is item analysis. Item analysis spreads out the scores of subjects who take a test by analyzing the test items on the basis of how many (%) of the subjects got the item correct. Test items that consistently spread out subjects' scores are kept in the test. Those that do not are removed or revised.

Borg and Gall (1971, p. 132-163) indicate that an underlying assumption for inferential measurements is that the population to which a test instrument is administered is normally distributed. Any significant departure from which the subjects come will affect the meaning of the results.

When defining direct measurement, several differences become apparent. Direct measurement refers to measurement instruments that: (1) make no assumptions about the population being normally distributed. (2) Do not utilize statistical techniques to give test results meaning. (3) Measures directly from the curriculum program in which the subject is engaged.

Concerning statistics, reliability coefficients are not applicable because the intent of direct measure is to determine if every subject has learned a particular educational task. It is further assumed that if every subject does not receive a perfect or near perfect score, that at a later administration they will. This renders the idea of the consistency of test-retest scores not applicable.

Validity coefficients are not applicable because there is usually no attempt to predict a score on one test from another. A comparison of results to an external measure will not yield anything particularly meaningful. For example, if a subject scores low on a direct measurement and this score is compared to a low score received on a standardized achievement test, the only conclusion that can be drawn is that the subject received a low score on both tests. The results of the tests are not directly comparable because inferential tests usually report results in standard score form while direct measurements, usually teacher constructed, report results in raw score form. However, it should be noted that Gronlund (1973, p. 47-50) outlines a method that utilizes an expectancy table that yields criterion referenced predictions. He does not indicate that statistical techniques are utilized.

Content validity is applicable to both types of measurements. The question is posed, do the test items actually sample the material which truly evaluates the subject's knowledge? Such can be answered for both measurements by carefully examining the content of the material to be covered and then examining the test items to determine if the material is adequately reflected in the test items. Ebel (1975) points out that content validity is determined by the nature of what you are trying to measure. Such comment infers that a norm referenced test, an example of an inferential measurement, does not necessarily intend to measure the same thing a criterion referenced test, an example of a direct measurement, intends to measure.

Item analysis, an essential process for inferential test instruments, is not applicable to direct measurement because there is no attempt to spread out the subject's scores. It is assumed that all subjects will be able to get all test items correct if the instructional program used has done its job. To further explain, it is most important for direct measurement that

test items all subjects get correct are indicative of the success of the subjects in learning educational tasks. For the inferential test, items that all, or a high percentage, get correct are considered bad items and removed or revised because they "bunch up" subjects' scores and do not distribute the scores along a normal continuum. Downie and Health (1965) indicate that an item that 50% of the subjects get correct and 50% get incorrect is considered a good item to retain.

This writer feels that criterion referenced mastery tests probably represent the most common type of direct measurement; however, all criterion referenced tests are not always direct measurements. As skills become more complex, a representative sample of test items must be used to test a particular educational task. It is further felt that criterion referenced tests are usually based on some degree of task analysis. Gronlund (1973, p. 3-4) notes that the area to be evaluated must be limited by breaking the educational task into small units.

To get a better picture of the basic differences between the two types of measurements, a table has been prepared.

HOW DO THE MEASUREMENTS DIFFER?

Inferential	Direct
1. Tests are based on the assumption that the subjects being evaluated come from a normally distributed population.	1. Tests make no assumption about subjects coming from a normal population distribution.
2. The main purpose is to "spread out" subjects scores along a normal distribution curve.	2. The main purpose is not to distribute scores but determine the degree of knowledge about a specified educational task.
3. Test items that do not cause subjects to "spread out" are removed and replaced by items that do.	3. Test items are not removed that all subjects get correct, rather it is hoped all subjects will get all items correct.

4. Test results are used to make predictions about a subject's probable chances for success or failure (I.Q. score low, achievement score will be low).	4. Results are reported as they actually occur. Scores are treated as nominal data. Subject meets criterion specified -- subject does not meet criterion specified.
5. Test results are reported as standardized scores, percentiles, stanines, Z scores, etc. Each describes a position in relationship to a normal population curve.	5. Does not use standardizes scores. Test results are reported as raw scores, usually percent correct or responses per duration unit of time (rate).
6. Identifies behavioral characteristics that collectively are catagorized as syndromes or "conditions".	6. Does not attempt to identify syndromes or "conditions" (perceptual handicapp).

Referring to Bateman's definitions of diagnosis and educational planning, inferential measurements lend themselves more appropriately to the diagnostic remedial approach. Direct measurements, particularly criterion referenced measurement, lend themselves more readily to the task analysis approach. It becomes apparent that a particular kind of measurement seems suited to a particular identification and educational planning approach.

If the current task analysis trend continues to grow, the definition developed for learning disabilities by the National Advisory Committee to the USOE in 1968 will need some revision. Such will be necessary to accommodate the task analysis approach as Bateman (1967) and Thiagarijian (1975) define it. To fit the current definition of learning disabilities, inferential measures such as the ITPA, WISC, Frostig Test of Visual Perception, etc. must be employed to yield information about behavioral characteristics that can be collectively used to describe a syndrome or "condition" (i.e. perceptual impairment). Task analysis advocates rely more heavily on criterion referenced measurements to identify a child as learning disabled. These advocates could, as a possible summarization of their approach, use

a premise set forth by Bereiter and Englemann (1966): "If the child has not learned, he has not been successfully taught." If this were the case, much of the current definition of learning disabilities would not be appropriate.

Hammill (1972) states that "if all ambiguous and superfluous phrases were deleted from the definition of learning disabilities, the following would remain: 'Children with special learning disabilities exhibit problems in listening, thinking, talking, reading, writing, spelling, and/or arithmetic.'" Hammill further states "Doubtless this is the operational definition of LD used in many schools today." This definition would lend itself more readily to the task analysis approach and the use of direct measurement in identification and educational planning for children with learning disabilities.

In summation, it is felt that the type of measurement is directly related to the particular approach utilized by a special educator in identifying and planning educational programs for children with learning disabilities. It should be further noted that no one approach has been proven conclusively to be better than another as many in literature may imply. Rather, it is more important to understand the nature of measurement and its appropriate use.

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